

CLAIMS

1. A lithographic apparatus comprising:
 - an illumination system configured to provide a beam of radiation;
 - a support structure configured to hold a patterning device, the patterning device configured to impart the beam with a pattern in its cross-section;
 - a substrate table configured to hold a substrate, the substrate table comprising:
 - a plate comprising a plurality of burls, a density of the burls being higher in a peripheral portion of the substrate than in a medial portion thereof, and
 - a port configured to exhaust a fluid so as to establish a pressure differential across the substrate held on the plate, the pressure differential being greater in the peripheral portion of the substrate than in the medial portion of the substrate;
 - a projection system configured to project the patterned beam onto a target portion of the substrate; and
 - a liquid supply system configured to supply a liquid to a space between the projection system and the substrate.
2. Apparatus according to claim 1, wherein the ratio of the density of burls in the peripheral portion to the density of burls in the medial portion is substantially equal to the ratio of the pressure differentials in these portions during use of the apparatus.
3. Apparatus according to claim 1, wherein the burls in the peripheral and medial portions are all of substantially the same nominal size but the number per unit area is greater in the peripheral portion.
4. Apparatus according to claim 1, wherein the cross-sectional area of the burls is greater in the peripheral portion.
5. Apparatus according to claim 1, wherein the peripheral portion is a substantially annular region extending inward of the outer periphery of the substrate.

6. Apparatus according to claim 5, wherein the annular region has a width in the range of from 5% to 20% of the radius of the substrate.

7. Apparatus according to claim 1, wherein the burl plate has an upstanding wall separating the peripheral portion from the medial portion.

8. Apparatus according to claim 1, wherein the density of burls is substantially constant within the peripheral portion.

9. Apparatus according to claim 1, wherein the density of burls is substantially constant within the medial portion.

10. Apparatus according to claim 1, comprising a gas inlet under the medial portion of the substrate to provide a flow of gas under the substrate outward from the medial portion towards the peripheral portion.

11. A device manufacturing method comprising:
holding a substrate on a burl plate by a pressure differential across it, the pressure differential being greater in a peripheral portion of the substrate than in a medial portion thereof, and the density of burls on the burl plate being higher in the peripheral portion than in the medial portion; and
projecting a patterned beam of radiation through a liquid onto a target portion of the substrate.

12. Method according to claim 11, wherein the ratio of the density of burls in the peripheral portion to the density of burls in the medial portion is substantially equal to the ratio of the pressure differentials in these portions during use of the method.

13. Method according to claim 11, comprising providing a gas flow under the substrate outward from the medial portion towards the peripheral portion.

14. A burl plate for use in a lithographic projection apparatus in which a high-refractive index liquid is supplied to a space between a projection system of the lithographic projection apparatus and a substrate held on a substrate table of the lithographic apparatus, wherein the density of burls in a peripheral portion of the burl plate is higher than in a medial portion thereof.

15. Burl plate according to claim 14, wherein the ratio of the density of burls in the peripheral portion to the density of burls in the medial portion is substantially equal to the ratio of the pressure differentials in these portions during use of the lithographic projection apparatus.

16. Burl plate according to claim 14, wherein the burls in the peripheral and medial portions are all of substantially the same nominal size but the number per unit area is greater in the peripheral portion.

17. Burl plate according to claim 14, wherein the cross-sectional area of the burls is greater in the peripheral portion.

18. Burl plate according to claim 14, wherein the peripheral portion is a substantially annular region extending inward of the outer periphery of the substrate.

19. Burl plate according to claim 18, wherein the annular region has a width in the range of from 5% to 20% of the radius of the substrate.

20. Burl plate according to claim 14, wherein the burl plate has an upstanding wall separating the peripheral portion from the medial portion.

21. Burl plate according to claim 14, wherein the density of burls is substantially constant within the peripheral portion.

22. Burl plate according to claim 14, wherein the density of burls is substantially constant within the medial portion.